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(Information requested.)

TUNGSTEN ORE REFINING IN CHINA

In general, there are two ways of making tungsten iron, the electric heat method and the aluminum heat method which was developed by Chung Shih-chien. Because there was a shortage of raw materials and a stoppage of electricity in Ch'ung-ch'ing, the electric heat method was both difficult and costly. It requires a day's time and three stages in the process. This is not economical. Moreover, there often remains one percent of arsenic which cannot be dislodged and which debases the steel a great deal. As for the time required and quality produced, the aluminum heat method is far better. Consequently, the Yu-hsin Iron Works, under the management of Chung Shih-chien, decided to use the aluminum heat method, first trying it out on a small scale. This was done under the careful supervision of Liu Yu-min.

Ch'ung-ch'ing reporters were recently invited to view the process. Crushed wolframite was placed in a crucible along with powdered aluminum and iron and heated to a high temperature. Because aluminum has the capacity for drawing oxygen from other metallic oxides, thereby oxidizing itself and producing much heat, once the process is begun, the high temperature is maintained. At 3,000 degrees the iron, aluminum, and tungsten are all liquefied. The iron and tungsten combine and sink to the bottom. The dark gray material on the surface is black aluminum oxide hard enough to cut glass, really artificial diamond. This tungsten iron contains as much as 70 percent tungsten [sic], comparable to the US product. The entire process takes only about 10 minutes. White light and heavy smoke containing poisonous arsenic are given off. The original arsenic is thus expelled which cannot be done by the electric heat method.

This process was perfected with many difficulties as follows:

1. The raw materials were not always proportioned correctly, or the heating was too slow, which resulted in an imperfect mixture.
2. Impurities and foreign metals had to be removed before a good-quality product could be obtained.
3. The time of terminating the process had a bearing on the mixing of ingredients.

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These difficulties were overcome by patient and intelligent experimentation.

The Yu-hsin Iron Works was originally a foundry in Shang-hai, serving local industry. Moved to Ch'ung-ch'ing during the war, it combined with the Min-sheng Company and established four branches. During the war it rendered much service. In the making of various steel alloys, tungsten iron brought from the US was used at great cost and loss of foreign exchange. The company determined to open a new way with the results described above.

Now that laboratory experiments are over, a complete plant and a large supply of ore are needed. The production of tungsten in China is very strictly controlled now by the Resources Commission. Large-scale extraction may be started only with official approval. We can benefit greatly by not having to rely on imports from the US.

China stands first in tungsten resources, with Kiangsi and Hunan as the largest producers. China's tungsten reserves as surveyed by government geologists, amount to 2 million metric tons, or more than half the world's supply. The ore is found in Kiangsi, Hunan, Kwangtung, Kwangsi, Hopeh, and other provinces. China's production in 1937 was 165,178 quintals, and in 1939, 106,891 quintals. Annual production in China is about 60 percent of the world production.

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